

**An account of the varieties of the muscular system met with in the dissecting room of the University of Edinburgh, during the Winter session 1847-48 / by C.H. Hallett.**

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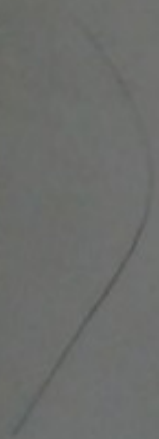
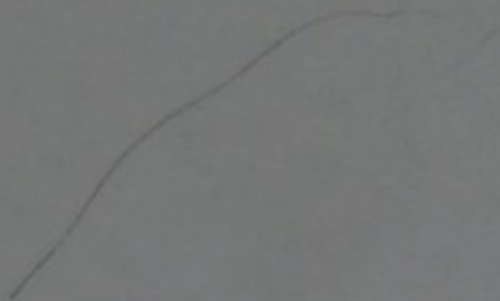
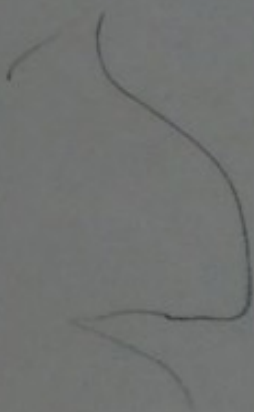
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Professor Bennett  
With respects

AN ACCOUNT  
OF THE  
VARIETIES OF THE MUSCULAR SYSTEM  
MET WITH IN  
THE DISSECTING ROOM  
OF THE  
UNIVERSITY OF EDINBURGH,  
DURING  
THE WINTER SESSION 1847-48.

By C. H. HALLETT,

LATE DEMONSTRATOR OF ANATOMY IN THE UNIVERSITY OF EDINBURGH.

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(From the *Edin. Med. and Surg. Journal*, No. 180.)

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THE following account of the various irregularities of the muscular system of the human body, noticed in the dissecting-room of the University of Edinburgh during the winter session 1847-48, is a continuation of the report,—published in this Journal (No. 174, Vol. lxi.),—of the varieties observed during the two preceding years.

It is necessary for me to mention, that the number of subjects dissected during the whole period over which my observations have extended, amounts to 200,—105 during the years 1846-47, and 95 during the winter of 1847-48. I mention this because it is requisite, that the absolute and relative frequency of any given variety should be determined. Indeed, this may be said to constitute the principal value of such observations, inasmuch as it enables the anthropotomist and the surgeon to form at once a pretty correct judgment of the nature and attachments of any variety which they may meet with during the dissection of the dead, or in operations on the living body, without exposing it completely.



Before commencing the descriptions, I would remark that I have not deemed it incumbent on me to enter so much into detail in this as in my former report. It is only where there has occurred an important difference in the mode of attachment, in the absolute and relative frequency, or in the relations, that I shall have to advert to the varieties described in the first report, and then as briefly as possible.

*Musc. Retrahens Aurem.*—In two subjects, the lower fasciculi of this muscle were observed passing on and attached to the external occipital protuberance, and enclosed in a fibrous sheath, as before described. Altogether this variety has been noticed five times, or once in every forty subjects; and, in every instance, it was found in very robust male subjects. In one instance, this muscle was developed to a great extent, the whole of its fibres taking their origin from the occipital bone,—the lower from the protuberance, the upper from near the mesial line above it. It was not divided, as usual, into fasciculi, but formed a continuous flat muscle, nearly an inch and a-half broad at its origin.

*Musc. Risorius Santorini.*—This muscle, which is normally connected with the *Platysma myoides*, and usually arises from the skin and fascia over the masseter muscle and the parotid gland, was found, in the subject dissected for the lectures, to be attached firmly to the skin opposite the outer border of the superior third of the sterno-mastoid muscle. It consisted of a flat fleshy mass about two inches in breadth; and, passing directly forwards beneath the *concha auris* and over the parotid gland and masseter, became considerably contracted, and was lost in the angle of the mouth. A considerable space intervened between the *platysma myoides* and it.

*Musc. Digastricus.*—With the exception of the *biceps flexor brachii*, there is no muscle in the human body which so constantly presents a multiplication of its bellies. A third head was observed once in every fifteen subjects,—the proportion named in my first report. Two remarkable variations from the usual attachments of the additional head have fallen under my notice. The first of these was constituted by the origin of three pretty large fasciculi of fibres from the hyoid bone, near the mesial line, and on both sides of the neck, which, passing upwards, mingled with the innermost fibres of the normal anterior belly of the muscle near the lower jaw, and were inserted with it into the depression which the muscle normally occupies. This variety showed that the *digastricus* has a tendency towards the doubling of its anterior belly.\*

The second variety was still more remarkable. The third belly arose by muscular fibres from a tendon continuous with, and evidently an offset of, the intermediary tendon of the *digastricus*,

\* This variety is described by Soemmering. De Corp. Hum. Fabrica.



and which passed inwards towards the mesial line, and over the smaller cornu of the *os hyoides*. The muscle passed forwards and upwards, and, having divided into two unequal portions, was inserted into the opposite side of the *symphysis menti*, previously interlacing with a corresponding abnormal head on the opposite side. Platner appears to have noticed a tendency to this variety, for he figures a third belly to the *digastricus*, which was inserted in the manner above described, but replaced the muscle of the other side.\*

In both these varieties, it is evident that the outermost fibres of the third belly, which have always a tendency to reach the symphysis of the lower jaw, were the only ones developed.†

*Musc. Stylo-Hyoideus*.—This muscle was found wanting, on one occasion, on the left side of the neck of a female subject, remarkable for the number of varieties by deficiency which it presented, not only in the muscular, but in the arterial system also. In some few instances, the *digastricus*, instead of perforating, passed wholly in front of it.

*Musc. Stylo-Glossus*.—This muscle presented a very uncommon variety in a subject in which an additional muscle, to be immediately described, was supplied to the pharynx. The variety consisted in its receiving additional fibres from the angle of the lower jaw, and also from the stylo-maxillary ligament. Some of these fibres mingled with those coming from the styloid process, but by far the greater number passed on separately to the tongue.‡

*Musc. Omo-Hyoideus*.—In my last report, I detailed the most important varieties of this muscle, tracing them through the different stages through which they appeared to pass; it is, therefore, unnecessary for me to repeat the descriptions, although I consider it incumbent on me to state, that every variety of this muscle, whether simple or complicated, is of the greatest importance, and that the descriptions I have already given have been fully confirmed by more extended observation.

The variety which, if met with in cases where it is necessary to perform operations in the subclavian triangle of the neck, would be most likely to confuse the operator, is where the omo-hyoid muscle has no attachment to the scapula, but takes its origin from the clavicle, in, but posterior to the interval between the sternomastoid and trapezius. I formerly stated that this variety was

\* De Musculo digastrico maxillæ inferioris. Leipsik, 1737. Tab. m.

† A cast of the second variety is placed in the anatomical museum of the University.

‡ Mozer, Deutsches Archives, &c., T. vii., p. 226, has apparently seen this variety; he describes the additional fibres as coming from the internal surface of the *pterygoideus internus*. In my own observation, they were traced with care to the stylo-maxillary ligament, as above-described. There can be little doubt that they are one and the same variety.



an uncommon one. I had then only seen it once; but I have now to state, that, in 100 subjects taken consecutively, it was found in no less than five, or, in the whole, in the proportion of three per cent.

On the right side of an adult male subject, the following variety was remarked. The posterior belly arose in its normal manner, but almost immediately divided into two, each being rounded and nearly of the same size as the ordinary posterior belly usually is. The superior division passed onwards, and gave rise, by the intermediate tendon, to the anterior belly, which was inserted into the hyoid bone normally. The inferior division passed into and mingled with the fibres of the sterno-hyoid muscle midway between the sternum and the hyoid bone, although the fasciculi of each were readily separated by the scalpel; it was inserted with the sterno-hyoid into the hyoid bone. Both posterior bellies were bound tightly down to the clavicle by the cervical fascia, and completely overlapped the subclavian artery in the third part of its course.\* Sels has noticed a special head pass into the sterno-thyroid muscle.† This variety is probably merely a modification of that in which the posterior belly ascends and passes into the sterno-hyoid or thyroid muscle.

The following variety presents the transition stage to complete absence of the muscle; it was observed on the left side of the neck of an adult male subject, the right omo-hyoid being attached to the clavicle as well as to the scapula. The posterior belly consisted of about a dozen muscular fibres, which gave rise to an exceedingly small tendon. The anterior belly arose from this tendon, and was nearly as large as it ordinarily is.‡

*Musc. Cephalo-Pharyngeus.*—The muscles of the pharynx are but little liable to variation, and when the varieties are noticed, they usually consist of nothing more than a more or less intimate connection with the muscles attached to the parts from whence the *constrictores pharyngis* take their origin. It occasionally happens, however, that the pharynx is furnished with an additional muscle, arising from a doubling of the stylo-pharyngeus, and the displacement of one of the divisions to either the temporal or occipital bones. Albinus and others have named this additional muscle, when it exists, the cephalo-pharyngeus. The only instance of this variety which has fallen under my notice, had the following attachments. It arose by an aponeurotic tendon, from the whole length of the vaginal process of the temporal bone, and, descending the neck with the stylo-pharyngeus, from which it was

\* A cast of this variety is placed in the museum of the University.

† De Muscul. varietat. Berlin, p. 6.

‡ This variety appears to be an extremely rare one. None of the older anatomists appear to have noticed it.



separated by the glosso-pharyngeal nerve, was lost amongst the fibres of the inferior constrictor muscle of the pharynx, spreading itself out on, and interlacing with, the fibres composing the outer surface of that muscle. This muscle was larger than the stylo-pharyngeus, and was present on both sides of the neck.\*

*Musc. Sterno-cleido-Mastoideus.*—I have already placed on record some instances of a double clavicular head. I have now to describe an instance in which the sterno-cleido-mastoid had four heads, two clavicular and two sternal. The second clavicular head arose from the clavicle in its ordinary position between the sternal and clavicular heads. The second abnormal sternal head was attached to the sternum, behind the normal head, and remained distinct from it to within an inch of the mastoid process of the temporal bone. All four heads were inserted together. I may also state here, that I have noticed the sterno-mastoid divided into two parts at its superior attachments, the muscle being bifid both above and below, but single in the centre.

*Musc. Trapezius.*—A tendency to deficiency of this muscle was noticed in three subjects, but in none to so great an extent as in the instance recorded in my last report. The trapezius in one subject was somewhat deficient on both sides,—the left more than the right. On the left side the muscle extended between the fourth cervical and the seventh dorsal spine; that on the right side was deficient in a corresponding degree below, but extended upwards to the occipital bone.

It is not uncommon to find the trapezius occupying the outer two-thirds of the clavicle when its occipital attachment is more extensive and more robust than ordinary. This has been remarked by all anatomists; but I am not aware that it has been seen by others so largely developed as not only to obliterate the space usually existing between it and the *sterno-cleido mastoid*, but also to overlap the clavicular head of the latter. I observed this in a male adult subject, remarkable for the large size of all the muscles on the neck, and the multiplication of others in the extremities.

This muscle in two instances was found to present a marked tendency to division into three muscles. The points at which the divisions existed were opposite the seventh cervical and the fourth dorsal spine. In both instances the lower division was more complete than the upper. This variety may afford a clue to the nature of the deficiency of parts of this muscle, either above or below, or in the middle, as observed by Soemmering.

*Musc. Latissimus Dorsi.*—The attachment of this muscle to the inferior angle of the scapula was not seen more than once in

\* More imperfect forms of this muscle have been described by Albinus, Sandifort, and others.



every six subjects, and then for the most part small and indistinct,\* showing, as I have stated elsewhere, that it ought to be considered an abnormal attachment.

The varieties presented by variations in the number of its attachments to dorsal spinous processes or to the lower ribs, were of frequent occurrence. These, however, were of no importance; but I have to record an instance in which the attachment to the ribs and lower part of the spinal column was normal, while the fibres attached to the crest of the ilium were wanting;—a remarkable circumstance, in as much as this is the most constant and least variable attachment of the muscle.

*Musc. Rhomboideus Major.*—This muscle often presented a marked tendency towards deficiency by a diminution in the number of its attachments to the dorsal spinous processes. With one exception, the only variety offered by this muscle was diminished size, from absence of the fibres usually attached to the third and fourth dorsal spines. The exception to this was observed in one of the subjects in which the trapezius was divided into three, and consisted in a more extended vertebral attachment than ordinary. In this subject, it was attached to six instead of four dorsal spinous processes.

*Musc. Levator Anguli Scapulæ.*—It is not often that this muscle is abnormal. The most frequent variety consists in an additional slip from the fifth cervical transverse process, or more rarely from the mastoid process. I have seen three instances of the former and one of the latter variety. This muscle also gives off occasionally slips which pass in various directions, as to the rhomboid muscles, the posterior superior serratus, the clavicle, and the first and second ribs. I have also seen a large slip pass off from it near its centre, and running upwards and backwards, lose itself in the trapezius close to the occipital protuberance; apparently a rare variety.

*Musc. Sternalis Brutorum.*—I have already traced this remarkable muscle through its various stages, from a few muscular fibres placed between the *pectoralis major* and the skin, to the large, fleshy, and robust muscle extending between the *sternocleido-mastoid* and the *rectus abdominis*, and shall therefore confine myself to the description of one of its forms which I am not aware has been described by other anatomists. The muscle arose by a strong tendon from the sternal tendon of the left *sternocleido-mastoid*, with which it appeared to be directly continuous. The tendon passed over the manubrial portion of the sternum, and on the right side gave rise to a thick fleshy belly, which was inserted into the fourth costal cartilage near its sternal articulation, and sent off a tendinous prolongation to connect itself with the

\* The proportion given in my last report was one to three.



*rectus abdominis*. This muscle is usually attached to the costal cartilages or the rectus, or both, on the same side from which it takes its origin, but in this instance, it crossed from one side to the other, although still preserving its distinctive characters.

Many other slight modifications of this muscle were remarked, but I do not consider them worthy of especial notice. I may state, however, that it was once seen double on the right side, and single on the left, in the same subject. I need scarcely add, that this is a rare variety.\*

*Musc. Pectoralis Major*.—The only variety of this muscle which I believe to be worthy of record, consisted in the complete separation of that portion which takes its origin from the abdominal aponeurosis from the sternal, and this from the clavicular portion. The sternal and clavicular portions were inserted normally into the interior of the bicipital ridge. The lower portion continued distinct from the rest throughout, crossed the axilla behind, and somewhat beneath the lower portion of sternal part of the muscle, and was inserted into the common tendon of the short head of the biceps and *coraco-brachialis*, about an inch below the coracoid process. The *pectoralis major* not unfrequently presents a tendency to division, and occasionally sends detached fibres to the biceps and *coraco-brachialis*; in the variety above described, we have a combination of two of its most common anomalies, and that more fully marked than usual.

*Musc. Pectoralis Minor*.—This muscle often varies in the number of its attachments to the ribs. In one subject, in which it was very large and robust, it arose from five ribs, from the second to the sixth inclusive; the superior portion was inserted as usual into the coracoid process, but the lower part passed towards the humerus, and was inserted by means of tendinous fibres into the anterior bicipital ridge, behind the tendon of the *pectoralis major*.

*Slips of Muscle in the Axilla*.—In my former report I described some remarkable slips of muscle passing through the axilla in connection with some varieties of the *pectoralis major*. In this one, however, I have thought it better to place them by themselves. The minor varieties I shall not notice, but the two following anomalies are, I believe, worthy of record.

A slip of muscle about an inch in breadth was observed crossing the outer part of the axilla, and passing obliquely over the axillary vessels, and the nerves in relation with them, at the point where a ligature is placed, when necessary, on the axillary artery in the lower part of its course. This slip of muscle was connected to the *latissimus dorsi*,—its muscular portion,—by inter-

\* A cast of this variety, and of one single on each side, is preserved in the museum of the University.



mediate tendinous fibres situated about two inches distant from the shaft of the humerus. In ordinary cases, this slip would have passed forwards to and have been blended with the *pectoralis major*, or have been connected with the coracoid process of the scapula; but in this instance, it was inserted by an aponeurosis into the fascia of the arm immediately over the *coraco-brachialis* and biceps, about two inches below the coracoid process. It was found in both axillæ, and is of importance to the surgeon.\*

The following abnormal muscle might perhaps have been best described amongst those of the muscles of the arm, but as it had no connection with those muscles, and passed through the axilla, I have noticed it in this place. It arose by an aponeurotic tendon from the whole length of the inner border of the coracoid process of the scapula. This tendon immediately gave rise to a pretty large muscular belly, about three inches in length, and three-quarters of an inch in thickness, which passed downwards over the tendon of the *subscapularis* muscle, and the inner part of the capsular ligament of the shoulder joint, and was inserted immediately above, and nearly in a line with the lower border of the tendon of the *latissimus dorsi*, into the shaft of the humerus. Before it was inserted into the humerus, it received the fibres of a second and much smaller belly, coming from the capsular ligament of the shoulder joint, to which it was attached by a thin tendon, from whence the muscular fibres originated.†

*Musc. Serratus Magnus.*—I have elsewhere described an instance in which the middle fibres of this muscle were wanting, an abnormal condition of the muscle which has been noticed and described by other anatomists. I have here to record a variety which appears to be a transition stage towards the formation of that rare anomaly. The variety occurred in an adult female subject, which presented others by redundance. The muscle had its usual number of slips from the ribs, and all were apparently of their normal size, but in passing towards the posterior or vertebral border of the scapula, they became collected into two large bundles, separated from each other by a cellular interval. The superior bundle was inserted into the upper third, and the lower bundle into the lower third of the vertebral border of the scapula, the middle third being unoccupied. There was thus a triangular interval left between the separated portions of the muscle, the

\* A cast of this abnormal slip is preserved in the museum of the University. No less than thirteen other varieties in the muscular system were discovered in the subject which presented this important anomaly.

† A cast of this remarkable abnormal muscle is placed in the museum of the University. Its superior attachments would lead one to suppose it merely a portion of the biceps, which, in other subjects, might have resulted in a multiplication of its heads.



apex being at the sixth rib, and the base at the vertebral border of the scapula.

Another remarkable variety of this muscle consisted in the greater part of the lower fasciculi, those connected with the 7th, 8th, and ninth ribs being wholly unconnected with the scapula. They were displaced, and were inserted by tendinous fibres into the vertebral aponeurosis, which they strengthened considerably.

*Musc. Teres Major.*—In the right shoulder of the subject in which one of the abnormal slips in the axilla before described was found, the following variety of the *teres major*, a muscle rarely abnormal, was observed. It was triple, the three portions being for the most part distinct throughout. The lower division of the muscle presented the normal attachment to the scapula. The middle division, more than an inch in breadth, arose in a line with the lower from the axillary border of the scapula, and extended as far outwards as the glenoid cavity. The superior division, which appeared to be an offset of a very robust *subscapularis*, also arose from the same border of the scapula, close to the glenoid cavity. They all passed outwards towards the humerus, the middle head folding behind, and becoming partially connected with the inferior one; both these were inserted together in the normal place. The superior head was also inserted into the posterior bicipital ridge of the humerus, in a line with the others, but its tendon was only slightly connected with that of the other two heads, and that only at the point of insertion.\*

*Musc. Teres Minor.*—This muscle is often so intimately blended with the *infra spinatus* muscle, that it is impossible to define it, or show it according to the descriptions given of its attachments, without very free use of the scalpel. In nearly one half of the subjects I have dissected, or have been dissected under my superintendence, no cellular interval between the two muscles could be detected. I direct attention to this, because it is necessary that the normal condition of the muscle should be defined.

*Musc Biceps Flexor Brachii.*—Thirteen subjects presented a third head to the biceps, that is, about one in every eight subjects; the same proportion was observed by Thiele. In the previous session, the third head was found but once in every fifteen subjects.

I have elsewhere stated that Meckel and others had seen the third head of the biceps consisting of a detached portion of the *brachialis anticus*, and therefore, when highly developed, and the connection not apparent, it may be considered as an offset of that muscle. The following curious and interesting variety supports that inference. The biceps had three heads, two of which were normally attached. The third head was confounded with the

\* A cast of this variety may be seen in the museum of the University.



upper part of the inner portion of the *brachialis anticus*, became detached from it as it descended the arm, and was inserted by two tendons into the upper and lower borders of the tubercle of the radius, distinct from the proper tendon of the biceps, which was placed between the two tendons of the additional head. The third head may therefore have three different destinations; it may be blended with the belly formed by the two normal heads, and this is by far the most common mode of termination; or it may be distinct from the biceps muscle, but give attachment to its semilunar process to the fascia of the fore-arm; or, lastly, be distinct throughout, and inserted separately into the tubercle of the radius.\*

The subject dissected for the lectures had the third head arising in its usual place in the left arm; but in the right, it arose from the capsular ligaments of the shoulder-joint between the two tuberosities. This variety is interesting, inasmuch as it shows that the *fourth* head of a quincipital flexor, such as I described in my first report, may exist without the *third* head being present.†

*Musc. Triceps Extensor Brachii.*—This muscle is but little liable to variation; the two following anomalies are therefore worthy to be recorded. The one consisted in the external head being double, the two portions being evidently produced by the division of the normal external head throughout its whole length. The other consisted of a fourth head arising from the surgical neck of the humerus between the lowest points of insertion of the *sub-scapularis* and *teres minor* muscles. This head passed down the arm and was inserted into the anterior surface of the tendon common to the long and the external head, near the commencement of the lower third of the arm, having previously sent off a considerable bundle of fibres to interlace and be confounded with those of the internal head.

*Musc. Flexor Carpi Radialis.*—This muscle is also one of those little subject to variation. The only variety this muscle has presented to my notice is the following. It arose by two heads, the one normally, the other, by means of a thin aponeurosis, from the oblique ridge of the radius, parallel to, and somewhat above, the radial head of the *flexor sublimis digitorum manus*. The muscular fibres attached to this aponeurosis converged to a point below and were connected with those of the normal head about the com-

\* Casts showing these modifications and many others may be seen in the museum of the University. The second modification was fully described in my former report. The two last, so far as I am aware, have not been noticed by other anatomists.

† A cast of this variety is placed in the museum of the University.



mencement of the lower third of the fore-arm. The tendon was inserted normally.\*

*Musc. Pronator Radii Teres.*—The following variety of this muscle is of so much importance in a surgical point of view, as to render it unnecessary for me to offer an excuse for describing it in detail.

The muscle arose normally from the internal condyle, &c., and near its insertion into the radius received the fibres of a considerable muscular belly, which had the following abnormal attachment above. It arose by two heads: one from the internal condyloid ridge between the internal head of the *triceps extensor* and the *branchialis anticus*; the other, from the internal inter-muscular septum,—that portion which represents, and is occasionally converted into the *humeral foramen*. The two heads were connected together by an aponeurosis, from which fibres also took their origin. The attachments of this abnormal head of the round pronator of the fore-arm, however, would be of little interest, were it not for the alterations it produced in the relations of the brachial and radial arteries. The brachial artery, together with its *venæ comites* and the median nerve, were drawn inwards, constricted and covered by the muscle for about an inch and a half above the bend of the elbow. The radial artery passed out from the bend of the elbow between the normal and abnormal bellies, and was subcutaneous throughout the whole of its course down the fore-arm.†

This variety appears to be a highly developed form of that figured by Professor Quain in his exquisite plates showing the surgical anatomy of the arteries.

*Musc. Palmaris Longus.*—In my first report, I stated that this muscle was found deficient in both arms once in every three subjects, and in a considerable moiety of the remainder it was deficient in one or other of the extremities. I have now to report its deficiency once in every seven subjects in the last hundred dissected, or once in every five subjects in the totality.

When deficient it is most commonly replaced by a slip sent off by the *flexor sublimis digitorum*. The following variety shows that this slip may be present when the muscle is normal. The *palmaris longus proper* arose from its usual points of attachment, and its tendon passed into the *palmar fascia*, having but very

\* A cast of this variety is preserved in the museum of the College.

† The extremity and a cast of the parts are preserved in the museum of the University. It may not be uninteresting to remark, that the superficial veins were abnormal; the cephalic vein and the veins communicating with the deep veins at the bend of the elbow being wanting. (This anomaly of the superficial veins is fully described in my paper on the anomalies of the venous system.—*Medical Times*, Nov. 13, 1847.)



slight attachments to the annular ligament. The abnormal muscle, placed internal to the normal one, was a highly-developed form of the offset from the *flexor sublimis digitorum*; its tendon passed into the annular ligament of the carpus.

In one instance, where the muscle was more highly developed than usual, it was completely divided into two in the longitudinal direction. The outer of these divisions was inserted into the scaphoid bone and the outer part of the annular ligament. The inner portion had its tendon double, one of which was attached to the pisiform bone and the inner part of the annular ligament, while the other gave rise to a fleshy belly which passed over the annular ligament, the ulnar artery and nerve, and terminated in a small round tendon, which blended with the fibres of the *abductor minimi digiti*, near its insertion into the base of the first phalanx of the little finger.

In two subjects the muscle was found completely doubled, each portion being inserted separately into the annular ligament and *palmar fascia*.

*Musc. Flexor Sublimis Digitorum*.—This muscle is but little liable to variation, unless we consider its occasional connection with the *flexor longus pollicis* as a variety. I have to state, that in two subjects,—both female,—the tendon to the little finger was absent in both fore-arms; but in neither case was it replaced by the deep flexor as seen by Quain.

In one subject, in which the muscle was large and robust, the fibres attached to the oblique ridge were found wanting.

*Musc. Flexor Profundus Digitorum*.—This muscle was found abnormal in four subjects. In one it had an additional head arising, by means of fleshy indigitations, from the upper three-fourths of the inner border of the radius, and from the interosseal ligament; the greater number of the fibres converged to a point near the wrist-joint, and passed into the tendon destined for the index finger, while others, after passing some distance down the fore-arm, curved upwards and outerwards, and were lost in the *flexor longus pollicis*.\*

In another subject, the outermost fibres of the muscle,—that portion connected with the tendon sent to the index finger,—were completely separated from the rest. This separated portion arose by two heads, both tendinous. The internal head was attached to the base of the coronoid process, to about an inch of the outer part of the ulna, and to nearly one-half of the interosseous membrane. The internal head arose from the internal border of the radius, immediately below its tubercle, and from the interosseous membrane. The muscle passed down the fore-arm between the

\* A cast of this variety is preserved in the museum of the University.



other portion of the deep flexor of the fingers and the *flexor longus pollicis*, and, near the wrist, gave rise to a tendon which was sent to the index finger. The anterior interosseal artery and nerve passed between the two heads of this separated portion of the deep flexor.\*

Another subject also had the outermost fibres completely separated from the rest, and forming a proper flexor of the index finger. In this instance, however, the muscle was only attached to the ulna and the interosseous membrane, the radial head seen in the former variety being absent.

In all of these varieties, which are mere modifications of each other, we observe the marked tendency to the formation of a special flexor of the index finger, always presented by the deep flexor, fully carried out. The following variety, however, shows that this tendency to division and separation is not confined to the portion acting on the tendon of the index finger. Some of the anterior and internal fibres of the muscle had been detached, and rested in the cellular interval between the superficial and deep flexors of the fingers. These detached fibres arose from the internal condyle of the humerus and the coronoid process of the ulna. Below it passed into a tendon, which was inserted into the distal phalanx of the little finger, after sending off a slip, in the palm of the hand, to be connected with the tendon for the ring finger, and coursing through the loop formed for it by the corresponding tendon of the superficial flexor. A special flexor of the little finger, therefore, existed in this subject.†

*Musc. Extensor Carpi Radialis Longior.*—This muscle was once seen divided into two, in the direction, and throughout the whole, of its length. The two portions were of unequal size. The larger was inserted into the metacarpal bone of the index finger as usual. The smaller was also inserted into the same bone in advance of the larger, and also sent a slip to the fascia at the wrist.

*Musc. Extensor Minimi Digiti.*—This muscle was found wanting once in every fifteen subjects. In all these cases, with the exception of one, it was replaced by a slip from the *extensor carpi ulnaris*. The *extensor communis digitorum* may also replace it, as stated in my first report; but no instance of this occurred in the last hundred subjects dissected.

In one subject, the muscle was found wanting in the left arm, with no indication of an attempt at its replacement by other muscles. In the right arm, however, the muscle was found completely double, a cellular interval separating the two portions,—a rather remarkable circumstance,—and both portions passed on to the little

\* A cast of this variety is preserved in the museum of the University.

† A cast of this muscle may be seen in the museum of the University.



finger. This variety was associated with deficiency of the tendon from the *extensor communis* to the little finger.

*Musc. Extensor Carpi Ulnaris.*—This muscle was seen, in one instance, to send off a slip of its tendon to the innermost tendon of the extensor of the finger, the proper extensor of the little finger being also present. This variety is of physiological interest, inasmuch as it shows, that, where a muscle is present, the muscles in its vicinity, which usually replace it when absent, may still develop the accessory portion. I have already noticed another instance of this in connection with the *palmaris longus*.

*Musc. Extensor Ossis Metacarpi Pollicis.*—I have elsewhere stated that this muscle generally presents a tendency to divide into parts near its insertion, and that this arrangement, from the frequency of its occurrence, ought to be considered the normal condition of the muscle; and also that this tendency to division not unfrequently resulted in the doubling of the muscle. I have now to record the most extensive and most extraordinary subdivision of this muscle which has probably ever been witnessed by the anatomist.

The muscle was divided primarily and completely into three,—an internal, a middle, and an external extensor of the metacarpal bone of the thumb; a distinct cellular interval intervening between each of them. The external and middle portions were again subdivided through the whole of their tendons, and through fully one-half of their fleshy bellies; so that there was exhibited a tendency to the formation of no less than five *extensores metacarpi pollicis*, three of the five being completely formed. The superior and external division was inserted into the *palmar fascia*, and part of it was also continuous with the short flexor of the same bone. The other four tendons were attached, one after the other and separately, into the metacarpal bone of the bone, from its base to near its centre.\*

The muscle was seen completely double, and the tendons inserted, as described in my first report, in five subjects, or in the proportion of one to twenty.

*Musc. Extensor Indicis.*—I would here again call the attention of anatomists to the frequent occurrence of more or less complete division of this muscle, one of the divisions forming a more or less perfectly developed proper extensor of the middle finger,—a muscle which exists normally among most of the quadrumana. It was found completely divided into two in ten subjects, and partially divided in twelve others.

*Musc. Abductor Pollicis.*—In one subject, in which the *extensor ossis metacarpi pollicis* was found double, this muscle was

\* A cast of this most extraordinary instance of multiplication of muscle is preserved in the museum of the University.



divided into two in the direction of its length; a cellular interval existing between the two portions. Both of them were attached to the base of the first phalanx of the thumb; but the more external of the two was considerably strengthened by fibres connected with the tendon of the *extensor ossis metacarpi pollicis*.

*Musc. Palmaris Brevis*.—The most common variety of this muscle is its complete deficiency, a tendency to this being frequently observed in the paucity and the extensive separation of its different fasciculi. Such being the case, it may not be uninteresting to record an instance of its enlargement. The muscle arose from the annular ligament of the *carpus* and the *palmar fascia* throughout the whole extent of the depth of the palm of the hand. The fasciculi were numerous and closely packed together, the whole forming a thick fan-shaped muscle, which was inserted into the skin as usual, but over a greater extent than ordinary.\*

It may be remarked, that oftentimes, when this muscle is supposed to be absent, careful dissection will display one or more small pale fasciculi of fibres.†

*Musc. Flexor Brevis Minimi Digiti*.—I have elsewhere recorded instances of the occurrence of a second head to this muscle, and I have in this report described a modification of this additional head in connection with the *palmaris longus* muscle, the additional head being displaced and connected with the abductor of the little finger. That such is the proper interpretation of the anomaly, is sufficiently shown by the instances I have described of numerous varieties of the *palmaris longus*, especially where it is replaced by other muscles, of the short flexor of the little finger, and also by the following anomaly.

A muscular slip arose from the deep surface of the *anti-brachial aponeurosis*, about two inches above the wrist-joint, passed downwards over the annular ligament, and concealing the ulnar artery and nerve, and, in the palm of the hand, gave rise to a small thin tendon which passed partly into, and intermingled with, the fibres of the *flexor brevis minimi digiti*, while another part was inserted into the inner side of the base of the proximal phalanx of the little finger.

This muscle is often connected with the annular ligament and palmar fascia, especially when the *palmaris longus* is absent.

*Musc. Triangularis Sterni*.—The abnormal conditions of this muscle, as described in my last report, were all found occasionally during the last year. The muscle, however, was not found completely deficient, as previously reported, in consequence, probably,

\* A cast in the museum of the University.

† I stated in my first report, that it was principally from careless dissection that this muscle was reported as deficient.



of a better mode of displaying it having been adopted, although the upper or the lower fasciculi were occasionally found wanting.

The usual tendinous, or rather aponeurotic connection between this muscle and the *transversus abdominis*, was found converted into muscle in four subjects. The *triangularis sterni* and *transversus abdominis* were therefore only continuous and inseparable once in every twenty-five subjects. The small proportion of subjects in which this condition of the two muscles is found, strengthens my opinion, stated in the first report, that Rosenmüller's proposition to describe them as one under the name of sterno-abdominalis, cannot be adopted, although the one is evidently a repetition of the other.

*Musc. Obliquus Externus Abdominis*.—A very robust male subject presented a remarkable deficiency of two of the digitations of this muscle. The fasciculi attached to the eighth and ninth ribs were wanting. A large hiatus in the muscle was thus produced between the digitations attached to the seventh and tenth ribs respectively. It was about two inches and a-half in extent, and was filled up by a very strong fibrous tissue. The tendon was complete.

*Musc. Pyramidalis*.—The first hundred subjects dissected presented this muscle deficient in the proportion of one to three; in the second hundred, however, it was found deficient once in every fifteen subjects; in the totality, therefore, it was wanting in the proportion of one to nine or ten.

*Musc. Psoas Parvus*.—I have already drawn the attention of the profession to the contradictory statements made by different anatomists with regard to anomalies of this muscle. I then stated that the *psoas parvus* was more frequently present than absent, the proportions being 61 to 54, and this proportion was preserved throughout the second hundred subjects. The remark made by Thiele,\* that he had opened twenty subjects consecutively, without having met with it once, is no doubt correct. I have myself seen it wanting in seventeen subjects, opened one after the other, and without regard to sex, but in the succeeding seven it was present in all. It is therefore necessary that a very large number of subjects should be dissected, before a conclusion should be drawn concerning the normal condition of a muscle so variable as this one evidently is. It is also necessary for me to remark, that when present, it will be most frequently found but on one side of the body, and that usually the right.

The assertion of Riolan,† that he had never seen the muscle in females, is strangely at variance with the statements of Wins-

\* Encyclopedie Anatomie, Vol. iii. art. *m. petit psoas*.

† Anthropographia, Vol. 5, p. 508.



low\* and John Bell,† and others, that it is more frequently met with in females than in males. In the first hundred subjects dissected, it was found as often deficient in the female as in the male; but, in the second hundred, it was more frequently present, in the proportion of seven to six. More extended observation may reveal some curious statistics of this muscle.

*Musc. Psoas Magnus.*—This muscle is but little subject to variation. The following is the only one which has fallen under my notice. The fibres attached to the first and second lumbar vertebræ were separated from the rest of the muscle, and passed onwards towards the thigh in a sulcus between it and the *iliacus internus*, the anterior crural nerve being placed first between the detached portion and the *iliacus internus*, and subsequently between the two portions of the muscle. Immediately below Poupart's ligament, the muscular fibres, collected into a belly about half an inch in breadth, gave rise to a tendon which immediately split into two;—one short and expanded, which intermingled with some of the fibres of the *iliacus internus*; the other, long and thin, like the tendon of the plantaris, which continued onwards in the direction of the combined flexors of the thigh, and was inserted distinct from both into the lesser trochanter.‡

This variety is a modification of one seen occasionally by Albinus§ and Meckel,|| the crural nerve having a slightly different relation to it. Meckel also states that it establishes an analogy with the great psoas in the apes.

*Musc. Pyriformis.*—This muscle was occasionally found divided into two unequal portions, the peroneal division of the great sciatic nerve passing between them. In one subject, the muscle was divided into two, but the lesser sciatic, and not a division of the greater sciatic nerve, passed out between them.

*Musc. Gemellus Superior.*—This muscle was found wanting on both sides in five subjects, and on the left side only in seven others. It was once observed double in the right hip of a male subject, the greater part of the great sciatic nerve passing between the two portions.

*Muscular slips in the Popliteal Space.*—In the middle of the popliteal space of an adult female subject, there existed the following abnormal muscle. It arose from the middle of the lower part of the femur, immediately above the condyles, and, passing superficially to the popliteal vessels and nerve, terminated in a small tendon which attached itself to the tendon of the gastrocnemius, where the two heads meet. It was closely applied to

\* Exposition anat. struct. corp. hum., Vol. ii., p. 211.

† Anatomy of the Bones, p. 341.

‡ A cast of this variety may be seen in the museum of the University.

§ Historia Musculorum Hominis, p. 315.

|| Anatomie Descriptive, C. Grand Psoas.



the plantaris as it descended; and this circumstance, combined with its attachments, has led me to regard it as an additional plantaris muscle; but, as this conclusion may not be generally received, I have described it in this place.\*

The following abnormal muscle is probably a modification of the preceding. It arose from the depression above the external condyle of the femur, and above the origin of the plantaris, crossed the floor of the popliteal space beneath the popliteal vessels, and was inserted by tendinous fibres into the *ligamentum posticum Winslowii*. The muscle was as large as the plantaris.

*Musc. Adductor Longus*.—This muscle was once observed divided into two throughout its whole length. The two divisions were placed side by side, the superior being the smaller. The lower perforating artery sent off, in this subject, from the great muscular branch of the superficial femoral, passed to the back of the thigh, between the two portions near their insertions into the femur.

*Musc. Adductor Brevis*.—The following supernumerary adductor of the thigh may be considered a variety of the short adductor, and, as such, I shall describe it. It arose from the *os pubis*, immediate above and in front of the origin of the *adductor brevis*, and, passing outwards, downwards, and backwards, first in front of the *adductor brevis*, and then behind the pectineus, was inserted into the posterior part of the small trochanter, behind the *psoas* and *iliacus*.†

*Musc. Gastrocnemius*.—This muscle received a slip of muscular fibres, about one inch in breadth, from the head of the fibula above the origin of the soleus. This slip of muscle was inserted into the tendinous part of the outer head of the gastrocnemius, near its union with the soleus, to form the *tendo Achillis*.

*Musc. Soleus*.—The tendency to the doubling of this muscle, by splitting in the direction of its length, was noticed in three subjects, but not to the same degree as in those described in my first report.

*Musc. Plantaris*.—That Meckel must have fallen into error when he stated that the plantaris was more inconstant than the *palmaris longus*, is evident from the observations of Gautzer, and from the fact, that while the *palmaris longus* was often wanting, the plantaris was only absent once in the whole 200 subjects over which my observations extend.

The following varieties of this muscle are somewhat remarkable. In a male subject, in which several anomalies by deficiency were detected, the plantaris was found to have two heads, separated

\* A cast of this variety is placed in the museum of the University.

† A cast of this supernumerary adductor is preserved in the museum of the University.



from each other by a distinct cellular interval. One of the heads arose from the space immediately above the external condyle of the femur. The other was attached also to the femur, below the first head, to the posterior ligament of the knee-joint, and to the tendon of the gastrocnemius; it was larger than the superior head, and, at the same time, broader and thicker. The superior head gave rise to the tendon into which the fibres of the inferior head were received. The tendon was nearly twice its ordinary size.\* The muscle was here evidently more robust than usual.

The same variety was found in the left lower extremity of an adult female subject. In the right lower extremity, however, the attachments to the femur were wanting, and that part of the muscle only which corresponded with the inferior head of the fellow in the opposite extremity was developed. These varieties indicate that the plantaris, when fully developed, is a double-headed muscle; that, in a large proportion of subjects, the superior head is wanting; and that, although they are sometimes seen together, they may either of them exist independent of the other. The slips seen in the popliteal space, and already described, appear to me to be nothing more than varieties of this superior head of the plantaris.†

*Musc. Extensor Hallucis.*—In four subjects the extensor muscle of the great toe was found divided through nearly its whole length into two unequal portions, the internal being invariably much larger than the external. The internal division was inserted in the ordinary manner. The external gave origin to a long thin tendon, which passed through a distant sheath in the annular ligaments of the ankle, and was inserted into the base of the proximal phalanx of the great toe, external to, and distinct from the tendon of the internal extensor.

This variety, or modifications of it, is the only one to which this muscle appears to be liable. Thiele‡ and Meckel|| have both seen it completely double. It is an interesting and important variety, inasmuch as it approximates the muscles of the great toe to those of the thumb.

*Musc. Extensor Brevis Digitorum Pedis.*—In seven subjects this muscle was observed splitting into five instead of four portions, the additional portion being placed between that passing to the great toe and that for the second toe. The tendon of this additional slip did not pass to either of the toes, but was invariably attached to the metatarsal bone of the second toe, and to

\* A cast of this variety is preserved in the museum of the University.

† Thiele was aware of the occasional existence of a second head arising from the femur. *Op. cit.*, p. 317; and *Hallsche Literaturzeitung*, 1808, No. 153. Casts of the modifications of this muscle are preserved in the museum of the University.

‡ *Op. cit.*, p. 308.

|| *Op. cit.*, extensor hallucis longus.



the tendon of the first dorsal interosseous muscle. In one subject all the tendons were found double, one being inserted normally, the other being attached to the metacarpal bones and to the tendons of the interosseous muscles.\* The first variety was described by Albinus,† and has been seen by Meckel,‡ Thiele,§ and others. Meckel considers it to be an attempt to form an indicator muscle corresponding to, and repeating that for the index finger of the hand.

The internal slip was often seen completely separated from the rest, and in one subject the four slips were separated from each other.

Besides the varieties which have been described in this report, many others were met with, which, for the reason set forth at the commencement, have not been noticed here. The most common of these occurred in about the same proportion as described in the first report; others, of minor importance, were not met with so often.

The extent of the general remarks appended to the last report, renders it unnecessary for me to say more than, that more extended observation has tended to strengthen my opinion concerning the correctness and general application of the rules therein advanced.

\* A cast of this variety is placed in the museum of the University.

† *Op. cit.*, p. 602.

‡ *Op. cit.*, court extensor commun des orteils.

§ *Op. cit.*, p. 328.











